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TRAVEL TIME RUN DRAWBACKS

Although the use of before-and-after travel time methodology is a reasonable way to evaluate the results of a corridor signal retiming project, there are certain drawbacks to this methodology that make it far from perfect. These drawbacks should be recognized when interpreting the results obtained. They include:

I. **Lack of comparability between travel time runs**
In order to conduct a proper comparison of before and after travel time runs it is desirable to have all traffic signal equipment functioning properly during both the before and after periods. If equipment is not operating properly then an accurate comparison between the "before" signal settings and the "after" signal settings cannot be made. The two most common types of equipment malfunctions that can play havoc with travel time runs are clocks that have drifted out of step (especially for time-based systems) and side street vehicle detectors or, worse yet, pedestrian detectors, that have stuck on.

II. **Lack of repeatability for the travel time runs**
In addition to the everyday random fluctuation in travel time due to varying traffic volumes, there are a number of systematic sources of travel time variation which occur. These include:

a.) Incidents such as accidents, vehicle breakdowns, or the presence of unusually slow vehicles in the traffic stream (very large trucks, mobile home transport vehicles, etc.) can cause congestion along the corridor, thus having a substantial effect on travel times. If these incidents are detected then the travel time run can be canceled, however, the real problem occurs when these incidents cause congestion but go <u>undetected</u>. When this happens, there is no way to tell what caused the congestion, an incident or poor timings.

b.) Periodic lane blockages can also cause congestion to occur on certain days and not others. A good example of this is SR 13 in Jacksonville, Florida where, during the morning rush hour, traffic from an elementary school drop-off zone sometimes backs-up onto SR 13, shutting down a travel lane for a period of time. This lane blockage is sporadic and difficult to detect, yet it has a dramatic effect on travel times along the corridor.

c.) Nearby railroad crossings can also have a dramatic effect on travel time runs. The effect that nearby railroad tracks have depends on their orientation relative to the corridor:

1. **Train tracks parallel to the corridor.** When a train enters the corridor each signal that has an at-grade railroad crossing and preemption capabilities will, in sequence, drop out of coordination and go into railroad pre-emption. Obviously, this has a substantial effect on progression, with the extent of the effect depending primarily on the size and speed of the train.

2. **Train tracks crossing the corridor.** If a train pulls across the corridor, even for a short period of time, the effect can be devastating.

3. **Train tracks upstream of the corridor.** If train tracks exist upstream of the corridor then the presence of a train across the tracks can cut traffic volume for a period of time, and then unleash a surge of traffic once the train clears. Depending on when the travel time run is started, this can either artificially reduce or increase travel times.

Once again, the main problem occurs when a train goes undetected (such as when the train is running ahead of the test vehicle along a corridor), yet its congestion effects are encountered.

d.) If a corridor has certain signals that are double cycled then the travel time run can be affected by the start time of the run relative to these double cycles. Runs that start on the set of double cycles that dovetail best with the "single cycle" intersections will tend to be faster than runs that start on the other set of double cycles.

e.) Traffic levels on the corridor can be affected by incidents on parallel corridors. For example, an accident or breakdown on one corridor can cause traffic to shift to another corridor which will affect traffic volumes and travel times.

III. **Lack of consistency in conducting the travel time runs**

There are a number of items that, if not accounted for, can produce inconsistent results. Some of the more common items are discussed here:

a.) Along many multi-lane roadways there is one travel lane that, for one reason or another, offers faster travel than the other lanes. This lane may vary by segment of the corridor, with the inside lane being a better choice over some segments and the outside lane being a better choice over others. The decision might be made to stay in one lane during the entire course of the run to eliminate this potential source of travel time variation, however, this may result in true "floating car" travel times not being achieved (In a true floating car travel time run, the number of cars passed by the test vehicle approximately equals the number of cars passing the test vehicle.)

b.) Travel times along many corridors vary widely depending on whether or not school is in session. With school out there are fewer buses on the road, fewer parents dropping off their children, and fewer students driving to school. Buses can further affect traffic flow if they stop on the roadway to pick-up or discharge students, stopping traffic while doing so. Reduced school speed limits during certain hours of the day can also have a substantial effect on travel times.

c.) Road construction or maintenance activities can effect travel times as can variations in the weather.

IV. **Incentive for the use of biased signal timings**

Since the signal timing engineer knows in advance that his work will be evaluated on the improvement in main street travel time that is achieved, there may be the tendency on his or her part to short-change the cross streets when it comes to green time allocation. We may end up with a corridor that has great progression along the main street but experiences repeated phase failures on the cross streets. If this happens, overall system performance will be damaged, even though the travel time runs will look great!

So the next time you see a set of before-and-after travel time runs that document a tremendous improvement in travel time along a corridor, be a little suspicious. It might be true, but then again...